

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

CORRECTED VERSION

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
12 October 2000 (12.10.2000)

PCT

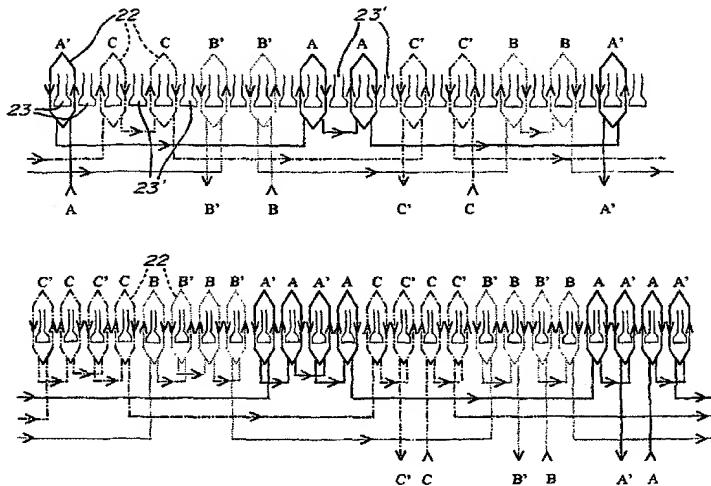
(10) International Publication Number
WO 00/60724 A1

- (51) International Patent Classification⁷: **H02K 21/22, H02P 6/24**
- (21) International Application Number: **PCT/CA99/00290**
- (22) International Filing Date: **1 April 1999 (01.04.1999)**
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (71) Applicant and
- (72) Inventor: **DUBE, Jean-Yves [CA/CA]; 43, rue Fortin, Asbestos, Québec J1T 4E5 (CA).**
- (72) Inventors; and
- (75) Inventors/Applicants (*for US only*): **CROS, Jérôme [CA/CA]; Appartement 7, 770, rue Belvédère, Québec, Québec G1S 3E5 (CA). VIAROUGE, Philippe [CA/CA]; 933, de la Gatineau, Sainte-Foy, Québec G1V 3A2 (CA).**
- (74) Agents: **HOULE, Guy et al.; Swabey Ogilvy Renault, Suite 1600, 1981 McGill College Avenue, Montreal, Quebec H3A 2Y3 (CA).**
- (81) Designated States (*national*): **AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW.**
- (84) Designated States (*regional*): **ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).**
- Published:
— *With international search report.*
- (48) Date of publication of this corrected version:
1 March 2001

(15) Information about Correction:
see PCT Gazette No. 09/2001 of 1 March 2001, Section II

[Continued on next page]

(54) Title: HIGH PERFORMANCE BRUSHLESS MOTOR AND DRIVE FOR AN ELECTRICAL VEHICLE MOTORIZATION



(57) Abstract: The system includes a permanent magnet three-phase motor and an electronic current controlled inverter by pulse width modulation. The motor has twenty-two poles and twenty-four slots, three phases and a cylindrical outer rotor. This structure minimizes torque ripple and maximizes energy efficiently. All coil windings are wound around the stator teeth. Several winding configurations are proposed and a special one with only one coil per slot. The motor phases are supplied by alternating rectangular current waveforms. A specific inverter control system is described to maximize efficiency and reduce current ripple and electromagnetic interference under motorizing or generating operations. The current control is realized by using the mosfets voltage for the current measurement.

WO 00/60724 A1

WO 00/60724 A1



For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.